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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/249,100 02/12/99 HIBI

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EXAMINER

IM52/1024

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NGUYEN, N
ART UNIT

PAPER NUMBER

1754
DATE MAILED:

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Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/249,100

Applicant(s)

HIBI et al

Examiner

N. M. NGUYEN

Group Art Unit

1754

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE three (3) MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Status

- ☒ Responsive to communication(s) filed on Oct. 10, 2001
- ☐ This action is FINAL.
- ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- ☒ Claim(s) 76, 79, 81-85, 87 is/are pending in the application.
- ☐ Of the above claim(s) _____ is/are withdrawn from consideration.
- ☐ Claim(s) _____ is/are allowed.
- ☒ Claim(s) 76, 79, 81-85, 87 is/are rejected.
- ☐ Claim(s) _____ is/are objected to.
- ☐ Claim(s) _____ are subject to restriction or election requirement.

Application Papers

- ☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
- ☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.
- ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

- ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- ☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been received.
- ☐ received in Application No. (Series Code/Serial Number) _____
- ☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

Attachment(s)

- ☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____
- ☒ Notice of Reference(s) Cited, PTO-892
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Interview Summary, PTO-413
- ☐ Notice of Informal Patent Application, PTO-152
- ☐ Other _____

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DETAILED ACTION

The request filed on October 10, 2001 for a Continued Prosecution Application (CPA) under 37 CFR 1.53(d) based on parent Application No. 09/249,100 is acceptable and a CPA has been established. An action on the CPA follows.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 76, 79, 81-85, 87 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In the claims, it is unclear if the amount of OH group is required for the titanium dioxide carrier before or after it is used to form the catalyst. If the amount of the OH group is for the titanium dioxide carrier before it is used to form the catalyst, the amount of the OH group between before and after it is used, i.e. between the titanium oxide starting material and the titanium dioxide in the final catalyst product, may be different.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are

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such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 76, 79, 81-85, 87 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grätzel '231, optionally in view of Bankmann et al (5,387,726) or Umemura et al (4,177,161).

Grätzel '231 discloses a catalyst comprising highly dispersed Ru/RuO_x (x less than or equal 2) on TiO₂ carrier (note Example 1 and claim 1). Grätzel '231 further discloses that in the case of TiO₂, mixture of anatase and rutile forms work very well as support material, however, pure anatase and pure rutile have also yielded good results when used in conjunction with the mixed ruthenium as a catalyst (note column 3, lines 26-31). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use pure rutile form as the support for the catalyst of Grätzel '231 because the rutile form have yielded good results.

For the product-by-process limitations, any difference imparted by the product by process limitations would have been obvious to one having ordinary skill in the art at the time the invention was made because where the examiner has found a substantially similar product as in the applied prior art the burden of proof is shifted to the applicant to establish that their product is patentably distinct not the examiner to show that the same process of making, see *In re Brown*, 173 U.S.P.Q. 685, and *In re Fessmann*, 180 U.S.P.Q. 324.

Grätzel '231 does not specifically disclose the amount of "OH" in the titanium dioxide carrier, however, the instant claims are drawn to a final product, not the raw material, i.e. the

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titanium dioxide carrier or the process of making the catalyst. This limitation can be considered as a product-by-process limitation, see *In re Fessmann*, *In re Brown* as stated above. There is no difference seen between the product of Grätzel '231 and the claimed product. It appears that the OH groups are inherently present on the titanium oxide (note instant application, page 46, lines 12-14), and in the event that the concentration of the "OH" group in the titanium oxide carrier used in Grätzel '231 is not the same as the required range, Grätzel '231 does disclose that the catalyst product is calcined at 375°C for 12-18 hours, which condition is similar to that disclosed in the instant application to adjust the OH concentration (note page 50, first full paragraph or page 123, lines 7-13, which stated that the OH group in the titanium carrier is eliminated by heating, and the content of the OH group can be controlled by changing the calcination temperature and calcination time), such calcination condition would render the titanium dioxide carrier in the catalyst product to have the similar concentration of OH group as required in the instant claims.

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to optimize the process condition in Grätzel '231 and in turn the amount of "OH" in the catalyst to obtain the best results, i.e. a catalyst suitable for hydrogenation processes.

Optionally, in the event that the instant claims require that the titanium dioxide carrier before it is used to make the catalyst has the claimed amount of OH group, Bankmann '726 or Umemura '161 can be applied to teach that it is conventional in the art to obtain rutile titanium

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oxide by calcining at 700°C for 5 hours (note Bankmann '726, lines 18-22) or 670-900°C for 30 minutes to 2 hours (note Umemura '161, lines 8-34).

Since Grätzel '231 teaches that the titanium oxide used should be in rutile form, it would have been obvious to one of ordinary skill in the art to calcine the titanium oxide to the temperature and for the amount of time as suggested by either Bankmann or Umemura to convert the titanium oxide to rutile form. These calcination condition would naturally adjust the amount of OH group on the titanium oxide to the claimed range.

Claims 76, 79, 81-85, 87 are rejected under 35 U.S.C. 103(a) as being unpatentable over Buysch et al (6,001,768), optionally in view either of Bankmann or Umemura.

Buysch '768 discloses a supported catalyst containing, a platinum, a platinum metal compound or a complex containing a platinum metal compound on a support comprising one or more oxides of the metals Ti, V, Mn, Cr, Fe, Co, Ni, Cu, La, Nb, Mo, Pb, the rare earth metals having the atomic numbers from 58-71 and the actinides having the atomic numbers 89-92 (note claim 1).

The support can be TiO_2 , preferably in the rutile form (note column 3, lines 56-60). The platinum metal can be Pd, Pt, Ir, Ru or Rh (note column 4, lines 34-36). Buysch '768 further discloses that it is possible to fix one or more platinum metals by precipitation with a base. Suitable bases are NaOH, LiOH, KOH, etc. (Note column 5, lines 24-55). The catalyst is prepared by methods which are known to those skilled in the art. Thus, solutions of one or more

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of the platinum metals specified can be applied to the catalyst support (note column 5, lines 16-23), drying (note column 6, lines 22-28), calcining (note column 6, lines 29-45). The calcining step fairly suggests that the platinum metal is present in the catalyst in an oxide form. The calcination is carried out in air, in vacuo or in a stream of gas at from 100-800°C and the calcination time is generally few hours, for example 0.5 to 50 hours, preferably from 1 to 30 hours (note column 6, lines 29-45). The overlapping ranges of the time and the temperature would give the titanium dioxide carrier the same OH concentration as required in the instant claims.

The difference is Buysch '768 does not specifically disclose an example with rutile titanium oxide as the support and ruthenium oxide as the catalyst material, i.e. the number of embodiments disclosed in Buysch '768 is too large for anticipation.

It would have been obvious to one skilled in the art to select any combination among the specifically disclosed compounds, *Merck & Co. Inc. v. Biocraft Laboratory Inc.* 10 USPQ 1846.

Optionally, Bankmann or Umemura can be applied as stated above.

Applicant's arguments filed August 13, 2001 have been fully considered but they are not persuasive.

Applicants argue that Grätzel '231 does not teach or suggest a supported ruthenium oxide catalyst including a titanium oxide carrier containing not less than 80% by weight of rutile titanium oxide.

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As stated in the above rejection, Grätzel '231 teaches that pure anatase and pure rutile have yielded good results when used in conjunction with the mixed ruthenium as a catalyst (note column 3, lines 28-30). Mixed catalyst is a catalyst contains both Ru and RuO_x (note column 2, lines 15-18) and Applicants' claims do not exclude the presence of Ru in the catalyst, as long as there is RuO_x.

Applicants argue that the declaration shows the difference between the claimed catalyst and the catalyst of Grätzel '231.

It should be noted that Grätzel '231 does teach the use of pure rutile, therefore, the comparison between the claimed product and a catalyst with just 20% rutile is not persuasive because it does not compare the closest prior art (i.e., the pure rutile as disclosed in Grätzel '231).

Applicants argue that Buysch fails to teach or suggest ruthenium oxide, supported on titanium oxide.

Again, the step of calcining in air or oxygen, as disclosed in Buysch (note column 6, lines 29-34), fairly suggests that the platinum metals, which includes ruthenium (note column 4, lines 34-36), are present in the final catalyst in the oxide form.

Applicants argue that Buysch does not teach or suggest a supported ruthenium oxide catalyst wherein the titanium oxide carrier contain an OH group bound to Ti in an amount of 0.1×10^{-4} to 30×10^{-4} mole per one gram of the titanium oxide carrier.

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As stated in the above rejection, the calcination step as disclosed in Buysch would adjust the OH amount on the titanium oxide carrier to the claimed range.


The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Ngoc-Yen Nguyen whose telephone number is (703) 308-2536. The examiner is currently on a part time schedule.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Steve Griffin, can be reached on (703) 308-1164. The fax phone number for this Group is (703) 872-9311 (for OFFICIAL After Final amendment only) or (703) 872-9310 (for all other OFFICIAL faxes). UNOFFICIAL fax can be sent to (703) 305-6078.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0661.

N. M. Nguyen
October 22, 2001


N. M. Nguyen
Primary Examiner
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